

1. Oklahoma Watershed Short Telephone Survey Report

1.1 Introduction

The purpose of the Oklahoma Watershed short telephone survey is to identify Oklahoma residents' values and attitudes towards the environment and to assess their knowledge of water quality problems in the Illinois River watershed. The three main goals of this telephone survey include:

- ▶ Evaluating respondents' knowledge and use of Oklahoma's waterbodies (particularly Tenkiller Lake and the Illinois River)
- ▶ Determining respondents' awareness of and perceptions about the sources of water quality problems in Oklahoma
- ▶ Identifying key messages respondents remembered from media stories (e.g., ads, news stories, and editorials) about the poultry industry.¹

The 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation found that Oklahomans have high participation rates in outdoor recreation activities. In 2001, 50% of Oklahomans had fished, 49% had walked a trail less than two miles long, 48% had visited an Oklahoma State Park, and 37% had camped. This 2001 study did not address the use of specific waterbodies or Oklahomans' knowledge about them, which is why further research is needed to evaluate Oklahomans' knowledge and use of Oklahoma's waterbodies (goal #1).

Little research has focused on Oklahomans' values and attitudes towards the environment. A 2002 study by Meo et al., however, used several methodologies to elicit some of Oklahoma's stakeholder and policy maker concerns and preferences for managing the Illinois River watershed. Using a content analysis of open-ended discussions, Meo et al. (2002) identified three relevant messages:

- ▶ Issues or concerns that are most visible or that have received the most media attention are the ones most frequently mentioned by respondents

1. The poultry industry refers to both chickens and turkeys.



- ▶ Water quality was the most frequently mentioned concern for respondents²
- ▶ Animal feeding operations (particularly poultry farms) were most frequently ranked as respondents' most important concern.

This 2002 study highlights the need for further research to learn more about Oklahomans' awareness of water quality problems and their perceptions of potential contributors to water quality problems in the state (goal #2).

Concerns about pollution from animal operations have gained the attention of politicians and the media in Oklahoma. In more recent years, the media has informed people about the use of excess waste produced from poultry farms in Oklahoma and Arkansas (litter from chickens and turkeys), which has caused water quality problems in the Illinois watershed. In response, the poultry industry has run several ads, editorials, and news reports (i.e., media stories) in an attempt to restore their damaged reputation. One component of this survey is to determine to what extent people hear and remember information about these media stories (goal #3).

This report summarizes the design, implementation, and results of the short telephone survey.

1.2 Oklahoma Watershed Survey Design

Oklahoma's rivers and lakes have become increasingly polluted over the past 40 years. Identified sources include sewage runoff, excesses use of fertilizer, and animal waste, among others. Of these sources, animal waste, particularly from the poultry industry, has played a significant role in the decline of water quality of rivers and lakes in eastern Oklahoma. This survey was designed to determine how Oklahomans' value these rivers and lakes, whether they have heard of any water quality problems, and what messages they remember from the media about the poultry industry. A copy of the survey instrument is included in Appendix A.

The survey – comprised of open and close-ended questions³ – was divided into five sections:

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2. These concerns were associated with aesthetic values rather than health and/or recreation values.
 3. Open-ended questions allow respondents to provide spontaneous answers, which do not have to fit into a specified set of alternatives. Close-ended questions specify the response categories, and respondents must choose from one of these categories. Open-ended questions were used to learn what type of language Oklahomans use to talk about the different issues raised in the survey.

- ▶ Screening questions and introduction
- ▶ Knowledge and use of Oklahoma's waterbodies
- ▶ Awareness of water quality problems
- ▶ Key messages from poultry media stories
- ▶ Respondent characteristics.

Screening questions and introduction

Two introductions were designed, and the sample was split so that half of the respondents received one introduction and the other half received another. The first introduction specified that the State of Oklahoma was conducting a survey, while the second introduction simply stated that a survey was being conducted.

Respondents were asked a series of screening questions at the beginning of the survey. The first screening question was designed to screen out individuals who did not live in Oklahoma. Only one respondent was screened out for residing outside of Oklahoma. Respondents were also screened out if they worked in any agricultural industry. A list of 760 telephone numbers of people known to work in the agricultural industry was provided to the survey administer to exclude from the sample. Two of these numbers were randomly selected and subsequently removed from the final sample.⁴

In this introductory section, respondents were also asked whether they worked in Oklahoma. About 58% of all respondents worked in Oklahoma at the time of the survey.

Knowledge and use of Oklahoma's waterbodies

Questions 5-15 were designed to gain a better understanding of Oklahomans' knowledge about and use of the Illinois River and Tenkiller Lake, as well as other rivers or lakes in the state. These questions were divided into three subsections:

- ▶ *Use of rivers and lakes in Oklahoma.* Respondents were asked whether they have ever visited a river or lake in Oklahoma (question 5), which rivers or lakes they have visited (question 6), and when they have last visited a river or lake in Oklahoma (question 7). To find out why respondents visited these rivers and lakes, respondents were asked what activities they participated in during their most typical visits (question 8).
- ▶ *Association of rivers and lakes with scenic beauty.* This subsection was designed to determine whether respondents thought any rivers or lakes in Oklahoma were known for

4. See the sampling methods (Section 1.3.1) for further explanation of the methods used by the survey administer to sample residents across the entire State of Oklahoma.

their scenic beauty (questions 9 and 10), and whether respondents have heard of any official designations of scenic rivers (questions 11 and 12).

- ▶ *General awareness of the Illinois River and Tenkiller Lake.* If respondents did not mention the Illinois River or Tenkiller Lake in any of the previous questions, they were asked directly if they have heard of either (questions 13 and 14). If respondents have heard of the Illinois River or Tenkiller Lake (or have mentioned the river or lake in any of the previous questions), they were asked where each is located (question 15).

Appendix B provides a detailed table summarizing the questions asked to determine respondents' knowledge and use of Oklahoma's waterbodies and the coded responses to those questions.

Awareness of water quality problems

A critical component of this survey was to determine whether respondents knew of any water quality problems in Oklahoma and what they perceived to be the causes of these issues. Before asking specific questions about water quality, respondents were given a chance to provide these answers without being prompted (questions 16-20). Questions 16 and 17 were designed to allow respondents to tell the interviewers about any impressions they have of the Illinois River (question 16) or Tenkiller Lake (question 17). This approach allowed respondents to state what they remembered without influencing their views by specifically mentioning water quality in the question.

Questions 18-20 were designed in a similar fashion. Respondents were asked whether they have heard of any issues or concerns in the Illinois River or Tenkiller Lake (question 18). They were then asked to describe these issues or concerns in more detail (question 19). As a followup to both of these questions, respondents were asked if they thought these issues or concerns applied more to the river or the lake (question 20).

If respondents did not mention any water quality-related concerns in the previous questions, they were asked directly if they have heard of any water quality problems in the region and what those problems were (questions 21 and 22, respectively). Respondents who described water quality problems (from question 22) were asked who or what is responsible for the water quality problems in the Illinois River or Tenkiller Lake. This question was designed to identify respondents' perceptions about different contributors to the pollution in the area.

Appendix C provides a detailed table of the questions asked to determine respondents' awareness of water quality problems in Oklahoma and their perceptions of potential contributors to water quality problems. Also included in Appendix C are the coded responses to these questions.

Key messages from poultry media stories

This section was designed to see if respondents have heard or seen any media stories (e.g., ads, editorials, or news reports) specifically related to the poultry industry (questions 24 and 29); to find out where respondents saw or head these media stories (questions 25 and 30); to see if respondents remembered the key messages (questions 27 and 31); and to determine whether respondents believed the key messages (question 28).

A series of followup questions were designed to see if respondents thought poultry growers in Oklahoma and Arkansas take adequate care of disposing of their poultry waste (question 32) and whether respondents felt there was a difference between how Oklahoma and Arkansas dispose of poultry waste (question 33). If respondents thought there was a difference, they were asked to describe the difference (question 34). See Appendix D for a detailed table summarizing all of the questions asked about key messages from the poultry media stories and participants' responses to these questions.

Respondent's characteristics

Questions 35-47 were designed to gather information on respondents' characteristics, such as age, race, income, and education. Appendix E provides a detailed table summarizing respondents characteristics.

The remainder of this report is divided into two sections:

- ▶ The implementation of the Oklahoma watershed survey
- ▶ The results of the Oklahoma watershed survey.

1.3 Implementation of the Oklahoma Watershed Survey

1.3.1 Sampling methods

A review of the literature on Oklahoma residents' attitudes towards water quality, outdoor recreation, and the environment revealed that more information was needed. A small telephone survey was implemented as a way to solicit this information from residents across the entire state. The average survey duration was 9.1 minutes with a range of 4 to 24 minutes.

Consumer Logic Inc., a firm specializing in telephone surveys, was subcontracted to conduct the interviews. Using a computer-assisted telephone interview (CATI) program, Consumer Logic contacted—or attempted to contact—4,312 residents across Oklahoma. Of these residents, 400 completed the entire survey, and the data from the completed surveys are used in this analysis. Consumer Logic conducted all of the surveys between November 1, 2006 and November 14, 2006. Refer to Appendix F for information on specific sampling techniques used by Consumer Logic.

How
was
Consumer
Logic
selected?
It was
cost

Consumer Logic provided a copy of the final disposition report upon completion of the survey. The American Association for Public Opinion Research's (AAPOR's) standards were used to calculate the response rate⁵ of 18.1%.

1.3.2 Coding responses

The data were coded and summarized in tables. Some of the data already had coded response categories; others, such as the open-ended questions (questions that have no predefined answers or categories of answers), were coded according to common themes among the answers.

1.4 Results of the Oklahoma Watershed Survey

1.4.1 Knowledge and use of Oklahoma's waterbodies

Use of rivers and lakes in Oklahoma

Approximately 86% of respondents have visited at least one of the state's rivers or lakes for recreation or sightseeing. Of these visitors, 25% have visited the Illinois River and 32% have visited Tenkiller Lake. Many respondents (86%) participated in water-based recreation on a typical visit (e.g., fishing, boating, floating, tubing, swimming). Respondents also have traveled to the rivers and lakes for picnicking, hunting, hiking, biking, and sightseeing. Table 1 summarizes respondents' use of Oklahoma's rivers and lakes.

Association of rivers and lakes with scenic beauty

Eighty percent of all respondents think one or more of Oklahoma's rivers or lakes are known for their scenic beauty. Of these respondents, 23% think the Illinois River is known for its scenic beauty and 25% think Tenkiller Lake is.

Twenty percent of respondents have heard of one or more official designations, 57% of whom are aware the Illinois River has been officially designated as scenic. Table 2 summarizes respondents' knowledge of scenic rivers and lakes in Oklahoma.

5. Response rate calculation = $(I+P)/((I+P)+(R+NC+O)+(UH+UO))$ where I = complete interview; P = partial interview; R = refusal and break-off; NC = no contact; O = other; UH = unknown if household/occupied household unit; UO = unknown; and e = estimated proportion of cases of unknown eligibility that are eligible.

Table 1. Respondents' use of Oklahoma's rivers and lakes

Criteria	Percent of respondents
Have visited any river or lake (n = 400)	86%
Have visited the Illinois River (n = 344)	25%
Have visited Tenkiller Lake (n = 344)	32%
Have participated in water-based recreation (n = 344)	75%
Have participated in land-based recreation (n = 344)	51%
n = number of respondents.	

Table 2. Respondents' knowledge of scenic rivers and lakes in Oklahoma

Criteria	Percent of respondents
Think one or more rivers or lakes is known for its scenic beauty (n = 400)	79%
Think the Illinois River is known for its scenic beauty (n = 317)	23%
Think Tenkiller Lake is known for its scenic beauty (n = 317)	25%
Have heard of an official designation for scenic rivers in Oklahoma (n = 400)	20%
Know the Illinois River has been designated as scenic (n = 79)	57%
n = number of respondents.	

General awareness of the Illinois River and Tenkiller Lake

Eighty-five percent of respondents who did not mention the river in any previous questions said they have heard of the Illinois River, and 83% of respondents who did not mention the lake in any previous questions said they have heard of Tenkiller Lake.

Nearly 60% of respondents knew the river and lake are located in the north east section of the state.

1.4.2 Awareness of water quality problems

When asked about their impressions of the Illinois River,⁶ many respondents commented on the river's beauty, cleanliness, and clarity, as well as the overall experience. Few respondents mentioned problems with pollution from chicken waste (6%) or pollution in general (4%). Table 3 summarizes respondents' impressions about the Illinois River and Tenkiller Lake.

Table 3. Respondents' impressions of the Illinois River and Tenkiller Lake

Respondents' impression	Percent who stated impressions of the Illinois River (n = 360)	Percent who stated impressions of Tenkiller Lake (n = 359)
Good for water-based recreation	29%	16%
Beautiful/fun place to visit	19%	24%
Clean/clear water	5%	12%
Chicken waste in the water	6%	0%
Other pollution issues	4%	3%
Low water levels	1%	0%
Too much drinking/partying	3%	0%
Not sure	36%	43%
Other	8%	8%
n = number of respondents.		

Respondents were also asked about their impressions of Tenkiller Lake. Their responses fell into the same categories as those from the previous question (impressions of the Illinois River), but the distributions of responses differed (see Table 3). More respondents characterized the lake as a beautiful, fun place to visit with clean and clear water. Pollution and chicken waste were mentioned more frequently as respondents' impression of the river and less frequently for the lake.

6. Respondents were asked questions about their impressions to determine if they would mention any water quality problems without being prompted.

Forty percent of respondents have heard of issues or concerns with the Illinois River or Tenkiller Lake. Of those who had heard of issues or concerns, about 43% think the river was contaminated with chicken waste. Fourteen percent have heard about pollution coming from Arkansas and 16% knew about pollution in general. Low water conditions and excessive drinking and partying were also concerns for some people. Table 4 summarizes respondents' awareness of issues or concerns with the Illinois River and Tenkiller Lake.

Table 4. Respondents' description of issues or concerns with Illinois River or Tenkiller Lake

Issues and concerns	Percent of respondents (n = 152)
Pollution from chicken farms	43%
Pollution from Arkansas	14%
Other pollution issues	16%
Low water conditions	2%
Too much drinking/too many people	18%
Not sure	4%
Other	12%
n = number of respondents.	

Table 5 compares how visiting the Illinois River, Tenkiller Lake, or other rivers or lakes affects respondents' awareness of issues or concerns with the river and lake. Only three respondents have visited just the Illinois River or just Tenkiller Lake. Two-thirds of respondents who have visited only Tenkiller Lake had heard of issues or concerns, whereas only one-third of Illinois River visitors had heard of issues or concerns. Of those who did not visit either the Illinois River or Tenkiller Lake and did visit other rivers, only 33% had heard of issues or concerns.

Table 5. Comparison of visitors to various Oklahoma rivers or lakes who have heard of issues or concerns with the Illinois River or Tenkiller Lake with those who have not

Area(s) visited	Percent who have heard about issues or concerns	Percent who have NOT heard about issues or concerns
Only the Illinois River (n = 3)	33%	67%
Only Tenkiller Lake (n = 3)	67%	33%
Only other rivers or lakes (n = 173)	34%	66%
n = number of respondents.		

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Table 6 illustrates the percentage of respondents who felt the issues or concerns apply more to the Illinois River, apply more to Tenkiller Lake, apply equally to the river and lake, or apply to all rivers and lakes in Oklahoma. Thirty-eight percent of this subset of respondents (i.e., those that had heard of issues or concerns) think the pollution from chicken farms applies more to the Illinois River than to Tenkiller Lake, and 43.8% think it applies equally to the river and lake. Only 3.1% of these respondents believe the chicken waste applies more to the lake.

Table 6. Percent of respondents who think the issues or concerns they described apply more to the river or the lake

Issues and concerns	Apply more to the Illinois River	Apply more to Tenkiller Lake	Apply equally	Apply to all rivers and lakes in Oklahoma	Not sure	Other
Pollution from chicken farms (n = 65)	34%	3%	43%	0%	18%	2%
Pollution from Arkansas (n = 21)	24%	0%	52%	0%	24%	0%
Other pollution issues (n = 25)	32%	8%	36%	4%	20%	0%
Low water conditions (n = 3)	33%	0%	33%	0%	33%	0%
Problems with alcohol/ too many people (n = 28)	57%	11%	18%	4%	11%	0%
Not sure (n = 5)	20%	0%	40%	0%	40%	0%
Other (n = 18)	17%	6%	33%	11%	28%	6%

n = number of respondents.

Table 7. Respondents' description of water quality problems in the Illinois River and Tenkiller Lake

Water quality concerns	Percent of respondents (n = 79)
Pollution from chicken farms	44%
Other pollution issues	24%
Waste dumped by other states	5%
Changing water chemistry	9%
Not sure	6%
Other	11%

n = number of respondents. [add text ref]

Table 7 summarizes respondents' descriptions of water quality problems in the river and lake. About half of the respondents who had heard of issues or concerns have also heard of water quality problems in the region. When asked to describe the water quality problems, nearly half of the respondents mentioned pollution from chicken farms (44%).

More than half of the respondents identified poultry farming as the group responsible for the water quality problems in the Illinois River and Tenkiller Lake (67%). Examples of "other" responses include the State of Arkansas, the State of Oklahoma, and the U.S. Environmental Protection Agency.

Table 8 shows a comparison of whether the visitors to just the Illinois River, Tenkiller Lake, or other rivers and lakes have heard anything about water pollution in the Illinois River or Tenkiller Lake. None of the Illinois River visitors had heard of water pollution issues. A few (18%) of the visitors to other lakes and rivers (not including the Illinois River or Tenkiller Lake) and two-thirds of visitors to just Tenkiller Lake had heard of water pollution issues.

Table 8. Comparison of visitors to various Oklahoma rivers or lakes who have heard about water pollution in the Illinois River or Tenkiller Lake

Area(s) visited	Percent who have heard about water pollution	Percent who have NOT heard about water pollution
Only the Illinois River (n = 3)	0%	100%
Only Tenkiller Lake (n = 3)	67%	33%
Only the rivers and lakes (n = 181)	18%	82%
n = number of respondents.		

1.4.3 Key messages from poultry media stories

Just over half of the respondents have seen or heard ads about the poultry industry, and of those who had seen or heard ads, 86% saw the ads on television. Half of these respondents have heard or seen the ads five or more times in the last five months – a period from Memorial Day to November 2006. When asked to describe the content of the ads, nearly 40% of respondents mentioned contamination from the chicken or poultry industry. A small fraction of respondents saw ads referring to the current lawsuit (4%). Others saw or heard ads in favor of the poultry

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industry (e.g., ads that mention a farmer's need to make a living or that discuss the ways in which the poultry industry is disposing of their waste).

A similar sequence of questions was asked for editorials and news reports (e.g., the content of the news stories). Just over 25% of respondents have seen editorials or news reports, and 80% of those respondents saw these on the television. Thirty percent of respondents who had seen editorials or news reports mentioned pollution from chicken farms. Very few (less than 1%) mentioned any pro-industry editorials or news reports (e.g., those describing farmers' needs to make a living or the poultry industry's attempt to clean up the waste). Table 9 shows the relationship between the messages respondents remembered from ads versus the messages from editorials or news reports.

Table 9. Respondents' description of the content of media stories about the poultry industry

Messages from media stories	Percent who described messages from ads (n = 204)	Percent who described messages from editorials or news reports (n = 106)
Chicken/poultry industry contaminating water	36%	29%
Poultry industry talking about ways to clean up the waste	4%	0%
Other pollution issues	15%	13%
Farmers' needs to make a living/ farmers are not exceeding the limits	12%	1%
Reuse of litter	4%	0%
Lawsuit filed	4%	7%
Not sure	17%	25%
Other	13%	26%
n = number of respondents.		

After describing what they saw or heard in the ads, respondents were asked whether they believed what they saw or heard. Table 10 shows the relationship between what people heard in the ads and whether they believed the ads. Just over 60% of respondents who described ads about water contaminated by the poultry industry believed what they heard. Of those respondents who had seen or heard ads, 56% believed the ads about the poultry industry cleaning up the waste, and 52% who heard something about farmers' needs to make a living believed the ads.

Twenty-six percent of respondents who had seen or heard news reports or editorials think Oklahoma and Arkansas take adequate care of disposing of waste, 40% said they do not take

adequate care of disposing of waste, and 36% have no opinion. Respondents were then asked whether they thought there was any difference between how Oklahoma and Arkansas dispose of their chicken waste. Only 15% thought there was a difference. Fifteen percent of these respondents (sixteen respondents) thought there was a difference between how Oklahoma and Arkansas dispose of their waste.

Table 10. Percent of respondents who believed the ads they described

Description of ad	Yes, respondent believed the ad	No, respondent did not believe the ad	No response	Other
Chicken/poultry industry contaminating water (n = 73)	60%	19%	19%	1%
Poultry industry talking about ways to clean up the waste (n = 9)	56%	22%	22%	0%
Other pollution issues (n = 31)	77%	10%	10%	3%
Farmers need to make a living\farmers not exceeding limits (n = 25)	52%	24%	16%	8%
Reuse of litter (n = 8)	50%	38%	0%	13%
Lawsuit filed (n = 8)	50%	13%	25%	13%
Not sure (n = 34)	12%	26%	62%	0%
Other (n = 25)	64%	28%	4%	4%
n = number of respondents.				

Table 11 shows the difference between how respondents felt Oklahoma and Arkansas dispose of their waste. Some of the respondents answering this question did not think Arkansas was taking adequate care in disposing of their waste. A small portion of respondents thought Arkansas was doing a better job and others thought both states were equally careless.

Table 11. Difference between how Oklahoma and Arkansas dispose of poultry waste

Response category	Percent of respondents (n = 16)
Oklahoma does a better job	31%
Arkansas does a better job	13%
Arkansas does not do enough	25%
Both are careless	6%
Not sure	13%
Other	13%

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n = number of respondents.
